SEARCHING CONTENT INFORMATION BASED ON STANDARDIZED CATEGORIES AND SELECTABLE CATEGORIZERS

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CROSS-REFERENCE TO RELATED APPLICATION(S)

This Patent Application claims the benefit of the filing date of United States Provisional Patent Application Serial No. 60/457,909, filed March 27, 2003 and entitled "SEARCHING
10 CONTENT INFORMATION BASED ON STANDARDIZED CATEGORIES AND SELECTABLE CATEGORIZERS," the entire content of which is hereby expressly incorporated by reference.

FIELD OF THE INVENTION

15 The present invention relates to a computer system and method for identifying material on a computer network. More specifically, the invention relates to searching content information based on standardized categories and selectable categorizers.

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BACKGROUND OF THE INVENTION

The Internet has been popularized by the rapid proliferation of the World Wide Web (WWW or Web). The Web links together a variety of computers around the world and
25 facilitates access to a tremendous variety of topics in a non-sequential web of associations that permits a user to browse from one topic to another, regardless of the format or the order of the topics. Users access and browse the Web using a web browser that generally resides and is executed on the
30 user's computer. Commercially available web browsers such as Netscape's Navigator™ and Microsoft Internet Explorer™ are very common and accessible by personal computer (PC) users.

The Internet functions based on a client/server model. In this model, a client computer communicates with a server
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computer on which information resides, and the client computer depends on the server to deliver requested information and services. These services may involve searching for information and sending it back to the client, such as when a database on the Web is queried. Other examples of these services are the delivery of information and web pages through a web site, and the processing of incoming and outgoing email. Typically, the client is a user PC (or other web devices) employing a browser to connect to and search the servers. The servers (also known as hosts) are usually more powerful computers that house the data and databases. The client/server model enables the Web to be conceived of as acting like a limitless file storage medium distributed among thousands of host computers, all of which are accessible by any individual PC user.

A popular way of finding information on the Internet is to use search engines, also known as search tools and sometimes called Web crawlers or spiders. Search engines are essentially tools to search massive databases that one accessible via the Internet. Search engines typically don't present information in a hierarchical fashion. Instead, one searches through them similar to a database, by typing keywords that describe the desired information.

However, search engines' ability to assess electronic content is limited by the fact that they are merely software programs, inherently lacking the subtlety and flexibility of human judgment. This restricts a search engine's ability to determine what a web page is actually about. For example, a search engine scanning Jonathan Swift's "A Modest Proposal," with its deliberately outrageous plan for raising Irish children as a food crop to be sold to English consumers, might conclude that the essay is about economics, agriculture, or

nutrition, but would be inherently unable to recognize the piece as a satirical work of Irish nationalism.

5   Because the ability to recognize aesthetic merit requires subtle human judgment, search engines are inherently incapable of identifying a good poem, a good song, or a good painting.

The shortcomings of the search engines also persist beyond the arts, where the subtleties of human judgment are

10   required to identify sound medical advice, valid technical information, or insightful social and political commentary. Regardless of the type of content sought, quality is a characteristic that requires human judgment to identify.

15   With more and more content becoming available on the Internet, and search engines returning thousands upon thousands of results for each search, it is no longer enough simply to identify the web pages that are about a given subject. What users want to see are the web pages on that

20   subject that are of high quality.

Certain attempts that have been made to date to interject human judgment-based quality evaluation into the process of helping users find electronic content. For the most part, these have taken the form of directories. In a directory

25   system, human editors are assigned responsibility for keeping up to date on what is noteworthy on the Internet in specific subject areas. When users go to a directory service, every link they see is to a web page that has been specifically recommended in this manner. Major endeavors to categorize

30   what is on the Internet using this technique include the volunteer-based Open Directory Project, whose work is available at www.dmoz.com, as well as the employee- and contractor-based efforts of the original Yahoo! ® directory service and About.com ™.

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But with directory services, the number of individuals evaluating online content in any given area is always small. Most often it is limited to just one person. The user is also given no choice in whose evaluations he prefers to go by. Unfortunately, no single person or small group can effectively represent the tastes and quality standards of all users.

In order to effectively to put diverse users in touch with the content that will meet their varied tastes and standards of quality, multiple and divergent evaluations of the same piece of content are needed. The user must also be able to pick the evaluator whose tastes he trusts.

Therefore, there is a need for a more effective system and method for searching content information in a large network of databases.

SUMMARY OF THE INVENTION

In one embodiment, the present invention is directed to a method and system for identifying content in a computer network. The method and system include the capability of selecting a plurality of predetermined categories stored in a database; categorizing a plurality of items corresponding to one or more of the plurality of predetermined categories, by a plurality of categorizers, respectively; selecting a category from the plurality of predetermined categories; selecting a categorizer from the plurality of categorizers; and initiating a search for one or more items in the computer network corresponding to the selected category and the selected categorizer. In one embodiment, results of the search may be displayed on a display and the results may be ordered based on a user selectable order.

In one embodiment, the present invention is directed to a method and system for categorizing an item to be searched by a user in a computer network including accessing a web site by an authorized categorizer; identifying the item to be categorized; selecting a category from a plurality of predetermined categories stored in a database accessible by the web site; applying the selected category to the identified item; and storing the identified item and the applied category in the database.

In one embodiment, an authorized user needs to sign up on a web site. The user is then capable of selecting a category from a plurality of predetermined categories; selecting a categorizer from a plurality of categorizers; and initiating a search for an item in the computer network corresponding to the selected category and the selected categorizer.

BRIEF DESCRIPTION OF THE DRAWINGS

The objects, advantages and features of this invention will become more apparent from a consideration of the following detailed description and the drawings, in which:

FIG. 1 is a block diagram of a typical Internet client server environment;

FIG. 2 is an exemplary process flow for a Categorize Material Function executed by one or more computers, according to one embodiment of the present invention;

FIG. 3 is an exemplary process flow for a Find Material Function, according to one embodiment of the present invention;

FIG. 4 is an exemplary data model diagram depicting the structure of the information used by the system, according to

5   one embodiment of the present invention;

FIG. 5 is an exemplary data model diagram depicting the structure of the information used by the system, according to one embodiment of the present invention;

FIG. 6 is an exemplary screen depicting a Find Material

10   Screen, according to one embodiment of the present invention;

FIG. 7 is an exemplary Search Results sub-screen, according to one embodiment of the present invention;

FIG. 8 is an exemplary screen for Content Categorization Screen, according to one embodiment of the present invention;

15   FIG. 9 depicts the bottom half of the exemplary Content Categorization Screen of FIG. 8; and

FIG. 10 is an exemplary Review Categorizations Sub-screen.

20   DETAILED DESCRIPTION

The method and system of the present invention provide means for users to find material on a computer network, such as the Internet, based on standardized categories being applied to particular items by recognizable persons and

25   organizations. Users are able to select a categorizer as well as a category. For example, a user can select Romantic Music from a Graphical User Interface (GUI), such as a displayed list, and select from another GUI a particular music critic (a categorizer) who has applied the category Romantic Music to

30   one or more items. The user is then presented with a search result set limited to items that meet both criteria.

One embodiment of the present invention involves the use of the Internet as a means for signing up users and categorizers, for processing their transactions and

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disseminating   information   based   on   categories   and
categorizers.

5   FIG. 1 shows a block diagram of a typical Internet client
server   environment   used   by   the   users   and   categorizers
according to one embodiment of the present invention.   PCs
220a-220n, used by users and categorizers, are connected to
the Internet 221 through the communication links 233a-233n.

10   Optionally, a local network 234 may serve as the connection
between some of the PCs 220a-220n, such as the PC 220a and the
Internet 221.   Servers 222a-222m are also connected to the
Internet 221 through respective communication links.   Servers
222a-222m include information and databases accessible by PCs

15   220a-220n.   In one embodiment of the present invention a
database resides on at least one of the servers 222a-222m and
are accessible by the processor, aggregators, participants,
and merchants using one or more of the PCs 220a-220n.

          In one embodiment of the present invention, each of the

20   PCs 220a-220n typically includes a central processing unit
(CPU) 223 for processing and managing data, and a keyboard 224
and a mouse 225 for inputting data.   Also included in a
typical PC are a main memory 227, such as a Random Access
Memory (RAM), a video memory 228 for storing image data, and a

25   mass storage device 231 such as a hard disk for storing data
and programs.   Video data from the video memory 228 is
displayed on the CRT 230 by the video amplifier 229 under the
control of the CPU 223.   A communication device 232, such as a
modem, provides access to the Internet 221.   Optionally, one

30   or more of PCs 220a-220n may be connected to a local network
234.   An Input/Output (I/O) device 226 reads data from various
data sources and outputs data to various data destinations.

          Servers   (hosts)   222a-222m   are   also   computers   and
typically have architecture similar to the architecture of PCs

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220a-220n.   Generally, servers differ from the PCs in that servers can handle multiple telecommunication connections at
5   one time.   Usually, servers have more storage and memory capability, and higher-speed processors.   Some server (host) systems may actually be several computers linked together, with each handling incoming web page requests.   In one embodiment, each server 222a-222m has a storage medium 236a-
10   236m, such as a hard disk, a CD drive or a DVD for loading computer software.   When software such as that responsible for executing some of the processes in FIGs. 1-4 is loaded on the server 222a, off-the-shelf web management software or load-balancing software may distribute the different modules of the
15   software to different servers 222a-222m.   Therefore, in one embodiment, the computer program responsible for executing the present invention resides on one or more servers.

An exemplary web site location 235 is shown on server 222a in FIG. 1.   The web site 235 is the user interface (UI)
20   for accessing the database.   The web site 235 has a unique address that is used by the users to access server 222a (in this example) and the web site location on the server 222a. The computer software for executing the processes of the present invention may also reside within the web site 235.   In
25   one embodiment, servers 222a-222m are protected by a firewall. The firewall permits a client to communicate with a server system, only if the information packet transmitted by the client system complies with a security policy set by the server system.   Thus, the firewall protects the system from
30   unauthorized users on the Internet.

The "Says who?" factor of being able to specify a categorizer up front, according to the present invention, enables users to limit their searches to material that has been categorized by persons and organizations they find
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credible.   This process effectively eliminates the "spam" and
clutter that currently bog down search engines.   Meanwhile,
5   the standardized categories eliminate much of the guesswork
and sloppiness inherent in existing techniques, such as word
matching.   Examples of standardized categories include music,
movies, books, politics, web pages, cars, consumer products,
"satire on current events", "California Plein Air", "Ford,
10   Mustang, Cobra", "osteomyelitis: symptoms and diagnosis", etc.

Using the present invention, categorizers have various
incentives to maintain accuracy and completeness in their
work.   In some cases, direct monetary payments are made to
categorizers, based on the number of users who have selected
15   an item through their categorizations.   In other cases, self-
categorizers find sufficient incentive in the increased
traffic that their participation in the service enables them
to draw to their own web sites.   Yet another type of incentive
involves making positioning in search result sets as well as
20   categorizer lists reflect the popularity and reliability of
the categorizers and pages.   High reliability is indicated by
a relatively low percentage of users coming back to the search
results page within a short time after having selected an
item.   A combination of two or more above-mentioned incentive
25   schemes maybe also used.

FIG. 2 is an exemplary process flow for a Categorize
Material Function executed by one or more of PCS 220a-220n and
servers 222a-222m, according to one embodiment of the present
invention.   Block 20 shows a login step.   In this step, the
30   categorizer is identified, and is tied to a credit card or
other payment method, etc., in order to effectively link a
categorization to a categorizer.

The item to be categorized is identified in block 21.   A
categorization links a particular item, which will become

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known to the invention via its internal database (if it is not already known there) to a particular category, which is also

5   stored in the internal database. In this step, the appropriate database record for the item to be categorized is either identified or created.

One way of performing this step is via an online screen, where the user enters the URL of a web page to be categorized.

10   For confirmation and validation purposes, an image of the page may appear in a portion of the categorization screen.

However, not every item to be categorized needs to have its own URL. For example, a particular cut of music might not have a unique web page devoted to it, yet it still needs to be

15   uniquely identified if it is to be categorized. In this case, a different unique identifier, such as the one used by the music vendor, is employed. Also, not every categorization is performed via an online screen. Magazines, for example, will often prefer to categorize their own online articles via batch

20   files and processes.

The categorization to be applied to item is selected in block 22. In an online categorization, the categorizer selects the category from the same GUI or other screen object that is offered to users who search for material on the

25   service. In batch categorizations, such as those performed for magazines, online music vendors, or merchants with web sites, selecting the categorization is a matter of specifying the unique identifier of the appropriate category record within the internal database.

30   In one embodiment, at least one of the predetermined categories relates to security and intelligence content, whether in the form of text, sound, still or moving images, or other media. This content may reside on the Internet, on one or more internal Intranets, or within purely internal servers

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and networks.   Other predetermined categories may relate to business intelligence content, whether in the form of text,

5   sound, still or moving images, or other media.

Items may include products sold and/or advertised over the Internet, such as arts and crafts, wine and cheese, microbrewery beers, and other products.   Items may also include services advertised over the Internet, such as

10   plumbing and air conditioning, auto repair, haircutting, legal or medical services, etc.

The categorization terms are displayed in block 23. Before making a categorization, the categorizers may want to know how much it will cost, as well as what financial

15   incentive, if any, will be paid to them when users select an item via their categorization.   However, not all categorizations are incentivized. For example, magazines may post categorizations of their online articles simply to boost traffic and advertising revenues, as well as to introduce the

20   magazines to potential new subscribers.   Displaying categorization terms is an optional step that the categorizer may choose to omit.

In block 24, selected categorization is applied to the item.   In this step, the categorization is noted but not

25   permanently applied to the database.   In one embodiment, the categorizer simply keeps on making additional categorizations until she has no more categorizations to make, as depicted by block 25.   In batch versions of the function, the absence of more items to be categorized is indicated by an end-of-file

30   condition.

As shown in block 26, categorizations may be reviewed and/or modified to date. This step enables the categorizer to see all his proposed categorizations to date, along with the costs associated with making them.   If the categorizer needs

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to stretch his budget, he may eliminate some proposed
categorizations that are less important to him, in order to be

5   able to make others that are more important to him.   In
certain cases where the categorizer has appropriate rights,
she may also change the name or description of an item. This
step is optional, and may be undertaken at any time before
Step 27.

10   Categorizations are posted to database and the
categorizer is billed in block 27.   This is the stage at which
categorizations become part of the service's retained
database.   The categorizer is charged for his categorizations,
to deter frivolous or "spam" categorizations, as well as to

15   provide a revenue stream to support the service.   Payment is
typically performed via credit card, although other payment
methods may also be used, particularly in the case of
corporate categorizers such as online music vendors, magazines
with online editions, and retailers.

20   FIG. 3 is an exemplary process flow for a Find Material
Function, according to one embodiment of the present
invention.   A category is selected from standardized set in
block 31.   Selecting a category from a standardized set
eliminates the "type and guess" problem common to existing

25   search functions.

For example, suppose a supplier, such as Acme Electronics
Corporation produces a video cell phone with model number
A1234 called the Communicator II.   Under the existing "type
and guess" method, a user searching for information pertaining

30   to this product does not know whether to type "cell phones,"
"video cell phones," "cell phones with video,"   "Acme A1234,"
"Acme Electronics A1234,"   "Acme Communicator II," or some
other combination of letters and numbers.   The possibilities
are enormous, and no matter which combination the user tries,

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he is virtually guaranteed to miss pages where the product is described in a slightly different manner. This problem disappears when those who categorize material and those who search for it both select from the same standardized list of categories.

A partial typing function eliminates the need for the user to know where to find a given category within the service's overall category structure. For example, to find material about osteoporosis, the user can type in "ost," and be presented with a set of standardized categories containing those characters—including osteomyelitis, osteopathy, and ostriches as well as osteoporosis. The user then selects the desired category from the resulting set.

Presented upfront with each category in the selection set is a count of how many items are categorized by category. This allows the user to know immediately whether to narrow or broaden his search. A "More Specific" function enables the user to narrow a search-for example, from "osteoporosis" to "osteoporosis symptoms" or "osteoporosis treatment." A "More General" function enables the user to broaden the search, for example, to "bone diseases" or "diseases involving dietary shortages."

More than one category can be specified to be matched, and the user can specify the manner in which multiple categories compound. For example, "meet all of these criteria" and "meet at least one of these other criteria" can be specified in the GUI. A "not" capability is also offered.

As shown in block 32, a categorizer is selected from the standardized set. Selecting a categorizer enables the user to specify whose judgment he trusts. For example, just seeing that a web page has been categorized as "responsibly researched" may not be enough for the user. What if this

categorization has been made by the Society of UFO Abduction Survivors? By specifying a more trusted entity like the Columbia University School of Journalism, the user can eliminate material of dubious appeal to him. Eliminating undesirable material also effectively increases the supply of genuinely desirable material the user sees within her search results.

A synchronization feature matches categorizers to categories. If for example, the user selects the category of "osteoporosis," the standardized set of categorizers shows only those who have actually assigned material to this category.

Once the user has selected a categorizer, the set of categories displayed is restricted to ones that the categorizer has actually used. For instance, if a rock music critic has not categorized anything in the field of "antique china," there is no reason to display this category for him. The user can go back and forth at will between steps 31 and 32. There is no requirement for these to be performed in any particular order, or for either step to be performed only once.

As depicted in block 33, the user can initiate a search for matches. When the user indicates that she is finished entering selection criteria, the service consults its internal database to find material matching what has been specified. In one embodiment, the sequencing of the search results is based on a page's popularity as well the popularity of its home page, plus the order in which categorizers have ranked each page relative to other pages they have categorized in the same manner. Other sequencing and display priorities are also possible. In one embodiment, the display sequencing can be set by the user.

As illustrated in block 34, an item is selected from search results. Selecting an item takes the user to it. For example, if the user selects a description of an article in the online edition of *The Atlantic Monthly,* that article is displayed on the screen.

FIGs. 4 and 5 are exemplary data model diagrams depicting the structure of the information used by the system, according to one embodiment of the present invention. The data model includes tables containing information about the items that are categorized, the categories used, and the persons or organizations who make the categorizations. By using only categories contained in rigorous, standardized indexed tables rather than freeform text, the system ensures that a user can always find every item to which a given category applies.

The tables are represented as boxes, and their interrelationships are represented by the lines connecting them. For example, in FIGs. 4 and 5, an Item Origination Role 46 links a Person or Organization 48 and an Origination Role Type 47 to an Item or Category 43C. When real data is loaded into these tables, an Item Origination Role might show the Person or Organization, e.g., "The Beatles" in the Origination Role Type of "Primary Artist" for the Item or Category "A Hard Day's Night."

Nuances in connecting lines reflect the nature of a relationship. As shown in FIGs. 4 and 5, a three-pronged line ending called a "crow's foot" indicates that there can be many of the entity it touches, while the absence of the crow's foot at a line ending means the relationship allows only one of the entity it touches. For example, an Item or Category can have many Item Origination Roles (e.g., "A Hard Day's Night" might have an additional Item Origination Role showing the Person or Organization "Ringo Starr" in the role of "Percussionist"),

but each Item Origination Role can pertain to one and only one Item or Category.

5   In this embodiment, whether a line is solid or dotted indicates whether the relationship is mandatory or optional from the standpoint of the entity it touches. Thus, "A Hard Day's Night" can exist as an Item or Category without having any associated Item Origination Roles, but an Item Origination
10   Role cannot exist unless it is linked to some specific Item or Category.

       In this exemplary data model, both items and categories are represented in the same table. This scheme enables "A Hard Day's Night" to be an end item in its own right, to
15   people who are shopping for music -- and at the same time, a subject or category, to people who are looking for reviews and other articles *about* "A Hard Day's Night." The Item Categorization table is what conclusively links an item to a crisply-defined category, as well as to the person or
20   organization making the categorization. More detailed information about each data table and its associated fields is available in a Data Dictionary enclosed as Appendix A with this disclosure.

       An exemplary way that users tell the system the kind of
25   material they're looking for is shown in FIG. 6, as a Find Material Screen. Users can pick a category first, or pick a categorizer first. They might pick a category without specifying a categorizer, or even choose a categorizer without specifying a category.

30   After the users have input their criteria, they select the "Show Matches" button 60, and are then presented with the Search Results Panel including a hyperlinked list of sites matching their criteria.

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Values 61 are a concatenation of ItemorCategory.*Description* and CategoryDetail.*DnmMatchCount*. Initially only those ItemsorCategories whose CategoryDetail.*TopLevelInd* = 1 are displayed. Thereafter, contents per user inputs on Items 62 through 68 can be changed. In one embodiment, any ItemorCategory whose *CategoryInd* is not = 1 is not shown in this screen, no matter what inputs the user gives.

The entries in this screen are ordered by the *StandAloneSequence* shown in their corresponding CategoryDetail, unless the user repopulates it via partial typing—in which case, they are ordered alphabetically.

When a user selects an ItemorCategory.*Description*, the row is highlighted, and also Item 66 is populated with the *DisplayNames* of only those PersonsorOrganizations who are CategorizingEntities for the ItemorCategory in question. That is, it is ensured that CategorizingEntity.*ItemCatID* matches the *ItemCatIDCategory* of the user's selection.

As a practical matter, this may mean that any access to the database for ItemsorCategories should actually populate internal arrays or data structures representing not only the appropriate set of ItemsorCategories, but also all associated CategorizingEntities and PersonsorOrganizations. However, this pre-population of internal data structures may be avoided if the net delay to the user of making another access to the database after a Category is selected is only slight.

When item 62 is selected, Item 61 is re-populated with parents of the category selected and its synonyms, via the following logic:

Identify synonyms as all ItemsorCategories whose ItemCatCorrelation.*ItemCatIDSubject* or ItemCatCorrelation.*ItemCatIDReference* = the *ItemCatID* of the

ItemorCategory that the user has selected from Item 1, and whose corresponding ItemCorrelationType.*SubjRoleDesc* or

5   ItemCorrelationType.*ReferenceRoleDesc* is "Synonym for."

For all synonyms as well as for the user-selected category, identify parents as those ItemsorCategories whose ItemCatCorrelation.*ItemCatIDReference* = the *ItemCatID* of the ItemorCategory that the user has selected from Item 1, and

10 whose corresponding ItemCorrelationType.*ReferenceRoleDesc* is "Included In." The results are then ordered by ItemCatCorrelation.*SubjectSeq*.

If no Categorizing Entity has been specified in Item 66, the results are ordered by ItemCatCorrelation.*SubjectSeq*.

15 If a single categorizer has been selected, the system additionally ensures that there is a CategorizingEntity reflecting that PersonorOrganization's *PersorgID* for every ItemorCategory being considered for display. Although this exemplary screen allows only a single categorizer to be

20 specified, multiple categorizers can be selected using a similar screen including a complex algorithm to sequence the values displayed in Item 61.

Error Condition A: If button 62 is selected when the user has not selected a value from Item 61, the error message,

25 "Please select the content category to see more general values for" is displayed with an OK button.

Error Condition B: If button 62 is selected when no ItemCatCorrelations whose corresponding ItemCorrelationType.*SubjRoleDesc* is "Is included in" are found

30 showing the selected ItemorCategory as *ItemCatIDReference*, display the error message "No more general levels exist" with an OK button.

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When item 63 is selected, Item 61 is repopulated with children of the category selected and its synonyms, via the
5   following logic:

Identify synonyms as all ItemsorCategories whose ItemCatCorrelation.*ItemCatIDSubject*   or ItemCatCorrelation.*ItemCatIDReference* =   the *ItemCatID* of the ItemorCategory that the user has selected from Item 1, and
10   whose corresponding ItemCorrelationType.*SubjRoleDesc* or ItemCorrelationType.*ReferenceRoleDesc* is "Synonym for."

For all synonyms as well as for the user-selected category, identify children as those ItemsorCategories whose ItemCatCorrelation.*ItemCatIDSubject* =   the *ItemCatID* of the
15   ItemorCategory that the user has selected from Item 61, and whose corresponding ItemCorrelationType.*ReferenceRoleDesc* is "Is   Include   In."   Order   results   by ItemCatCorrelation.*ReferenceSeq*.

Error Condition A: If button 63 is selected when the
20   user has not selected a value from Item 1, display the error message, "Please select the content category to see more specific values for" with an OK button.

Error Condition B: If button 63 is selected when no ItemCatCorrelations   whose   corresponding
25   ItemCorrelationType.*SubjRoleDesc* is "Includes" are found to show the selected ItemorCategory.*ItemCatID* as *ItemCatIDSubject*, display the error message "No more specific levels exist" with an OK button.

Area 64 enables the user to bypass navigating through
30   successive menu levels by partially typing a value here, then selecting Item 65 to display any matches to what has been typed. Trailing wildcards are assumed, i.e., in the example shown, just typing in "ost," without any special character as

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suffix, is enough to bring up "osteoblast," "osteoclasis," and all the other values shown.

5   When button 65 is selected, Item 61 is re-populated with only those ItemsorCategories whose *Descriptions* begin with the characters that have been typed into Item 64. The results are then ordered alphabetically.

Error Condition A: If button 65 is selected when fewer 10   than three characters have been entered into Item 64, display the error message "Please enter at least the first three characters of the value you want to match" with an OK button.

Area   66   is   Populated   with   appropriate PersonsorOrganizations' *DisplayNames*. When the screen first 15   appears, no values should be displayed here. Area 66 is populated subsequently based on the selection the user makes in Item 61, by finding all CategorizingEntities whose *Category IDs* match that of the specified ItemorCategory . The results are sequenced via the complex logic described in the General 20   Notes section that follows these Field-Specific Notes.

Once the user has selected an item here and highlighted it, what appears in Item 61 is restricted to the *Descriptions* of *only* those ItemsorCategories that are linked to the selected PersonorOrganization as a CategorizingEntity. This 25   restriction stays in place no matter how the user alters the contents of Item 61, unless the user selects the Clear Categorizer button (Item 69).

Additional processing depends on whether the user has already selected a category. If the user has already selected 30   a category, Item 61 is immediately repopulated with just the category that has been selected, and the display continues to show it as highlighted. If the user has not yet selected a category, item 61 is immediately repopulated to show just the highest-level categories that the categorizer has used, which

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are identified as cases where CategorizingEntity has its *CategorizerTopLevelInd* set to 1. The results are sorted alphabetically by ItemorCategory.*Description*.

As a practical matter, values for Categorizer will usually be obtained from an internal data structure or array populated as described in the description for Item 61. However, if the user bypasses Item 61 and goes straight to this item, then the array is populated via the database. In this event, the internal data structure or array items corresponding to CategorizingEntity and ItemorCategory are also be populated with whatever values are shown as linked- i.e., via joins on *PersorgID* and *ItemCatID*.

Area 67 enables the user to bypass scrolling through names via partial typing in this area. As with Category, trailing wildcards are assumed.

When Item 68 is selected, Item 66 is re-populated with only those PersonsorOrganizations whose *DisplayNames* begin with the characters that have been typed into Area 67. The results are ordered alphabetically.

Error Condition A: If Item 68 is selected when fewer than three characters have been entered into Area 67, the error message "Please enter at least the first three characters of the value you want to match" is displayed with an OK button.

When Item 69 is selected, the previously highlighted value in Item 66, is de-highlighted and the logical restriction that what is displayed in Item 61 reflect only ItemsorCategories that are linked to the previously specified PersonorOrganization via a CategorizingEntity is removed.

When item 60 is selected, the Search Results Sub-Screen is generated and displayed.

In one embodiment, the presentation order of categorizing entities reflects the following six factors, each of which is

5   a field within CategorizingEntity:

     (a) Categorizer's overall popularity within a user-specified subject area *(SpecificCatOverallHits)*

     (b) Categorizer's recent popularity within a user-specified subject area *(SpecificCatRecentHits)*

10   (c) Categorizer's overall popularity within a broader subject area *(BroaderCatOverallHits)*

     (d) Categorizer's recent popularity within a broader subject area *(BroaderCatRecentHits)*

     (e) Categorizer's reliability within a user-

15   specified subject area *(SpecificCatQuickReturns)*

     (f) Categorizer's reliability within a broader subject area *(BroaderCatQuickReturns)*

Values for each of the six factors are found within the CategorizingEntity record linking a given PersonorOrganization

20   to the ItemorCategory the user has specified. Popularity is equivalent to hits; reliability is the percentage of overall hits that are quick returns, where the lower the percentage, the higher the reliability.

Each of the six factors is multiplied by a weighting

25   factor found in a BusinessRule. The BusinessRule whose *Description* is "Categorizer Weighting;" is first found, then the component BusinessRules that are included in this one (i.e., those found in BusinessRuleInclusions with its *BizRuleID* as their *BizRuleIDIncluder*) are located. The

30   *Descriptions* of these component BusinessRules contain the following values:

     "Overall Popularity Within Specific Category"
     "Recent Popularity Within Specific Category"
     "Overall Popularity Within Broader Category"

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"Recent Popularity Within Broader Category"

"Reliability Within Specific Category"

5   "Reliability Within Broader Category"

An exemplary Search Results sub-screen is shown in FIG. 7. This screen is dynamic HTML, generated after the user selects the Show Matches button on the Find Material screen.

Area 71 shows *Name* of the ItemorCategory whose *ItemCatID*

10   appears in an ItemCatCorrelation.*ItemCatIDSubject*, and whose corresponding ItemCorrelationType.*SubjRoleDesc* is "Home Page," for a page returned as a search result. (May be blank.)

Area 72 shows *Name* of an ItemorCategory returned in the search, with hyperlink to its *URL*. Before the page is brought

15   up, selection counts are updated as described in General Notes below.

Area 73 illustrates *Description* of an ItemorCategory returned in the search. (May be blank.)

DisplayNames of all PersonsorOrganizations with

20   ItemCategorizations fitting the user's selection criteria are shown, by *DTMPosted*. The results are limited to 5. Hyperlinks are included so that when selected, they bring up a panel showing the *SelfDescription* of the PersonorOrganization making the categorization.

25   The order in which search results are presented is of significance, since utility to users depends on having the best matches to their criteria appear at the top of the list. In one embodiment, four factors are considered in the sequencing process:

30   (a) The popularity of a given page.

(b) The popularity of a given page's home page.

(c) Categorizers' internal rankings of the page, weighted to reflect the popularity of each categorizer.

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(d) As a tie-breaker, the DTMPosted for each page,
with preference given to the earliest poster.

5   The system starts by finding the BusinessRule whose
Description is "Search Results Sequencing".   One of this
rule's components is "Page Popularity," whose components in
turn are "Overall Hits," "Recent Hits," and "Quick Returns".
The *RuleSpecifiedFactor* assigned to each contains a weighting

10 factor. This weighting factor is multiplied by the
ItemCategorization's   *DnmOverallSelectionCount,*
DnmRecentSelectionCount,   and   *DnmQuickReturnCount*
(respectively), and added to an overall sum.

          Another component is "Home Page Popularity," whose

15 components are the same as for "Page Popularity."

          The third major component is "Rankings by Categorizers,"
which is computed as follows:

          Multiply   ItemCategorization.*RankingCredit*   by
          "CategorizerWeighting" (the latter value has already

20   been calculated to sequence the categorizers in the
          main screen).

          Add the result to a total representing a cumulative
          weighted average of the positions all the various
          categorizers have assigned the ItemorCategory.

25 Note that the appropriate weighting factor for each of
the three major components described above is shown in its
BusinessRule.*RuleSpecifiedValue See Appendix A)*.   In one
embodiment, the entire sequencing of the search results is
programmable by the user.

30 The system provides rewards to the sites that the users
choose most frequently, including favorable positioning within
search results sets, and in some cases, cash incentive
payments.   It is therefore necessary to keep an accurate
running tab of how many times users select a given page, under

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what content categories, and based on the recommendations of what persons or organizations.

Sometimes, the credit for a user selection is shared. For example, if the user has specified in his search criteria that either of two categorizing entities is acceptable, and both of these entities have categorized a content item in the specified way, then both entities validly deserve a share of the credit if the user selects that item.

Just as credit can be shared among entities, it can also be shared across content categories, in cases where the user specifies more than one category. Thus, whenever a user selects a content item with two or more content categorizations reflecting multiple user criteria, the credit is split among the categorizations.

In one embodiment, the crediting principle involved is that the sum of all credits for a given user selection must equal 1. In other words, if the user has specified four content categories, then each of these categories must be given equal credit of ¼. Likewise, if three user-specified categorizing entities have made content categorizations within one of the specified four areas, then each of these ¼ credits must be further split among the three entities, with each getting a 1/12 credit.

In one embodiment, computation of credits proceeds according to the following logic:

(a) Compute the number of credit units due an ItemCategorization = 1 divided by the number of ItemsorCategories the user has specified.

(b) Add the result of step (a) to the *SelectionCount* for the current *PeriodMonthYear* for the ItemCategorization itself, independent of whoever may have made the categorization(s). (In the database, this

is represented as a CategorizationBasedSelectionSummary pointing to the ItemCategorization where *PersorgIDCreator* is null.)

(c) Compute the credit due each categorizer, by taking the result of step (b) and dividing it by the number of categorizers specified by the user who have actually made the type of categorization the user has indicated. (NOTE: If the user has *not specified any* CategorizingEntities, then the credit is to be shared equally among *all* those PersonsorOrganizations who have created ItemCategorizations indicating the user-specified ItemorCategory for the user-selected ItemorCategory.)

(d) Add the result of step (c) to the *SelectionCount* for the current *PeriodMonthYear* of the CategorizationBasedSelectionSummary of each ItemCategorization in which the *PersorgID* of the user-specified entity appears as *PersorgIDCreator*. (NOTE: To maintain quick screen response time, update of these database counts can take place in an asynchronous mode.)

In one embodiment, a number of denormalized summary counts are used in the data model to improve performance, rather than keep the user waiting while the system goes off and makes various tallies and comparisons in real time. These counts are updated in batch mode. They include the following:

Within the ItemCategorization table, the fields *DnmOverallSelectionCount*, *DnmRecentSelectionCount*, and *DnmQuickReturnCount* are updated by tallying the values in the CatBasedSelectionSummary table, as guided by entries in the BusinessRule table to determine which selections to call "recent."

Within the CategorizingEntity table, *SpecificCatRecentHits, SpecificCatOverallHits,*

SpecificCatQuickReturns, *BroaderCatRecentHits*,

BroaderCatOverallHits, and *BroaderCatQuickReturns* are updated

5   in a similar manner, only the batch program receives further

guidance on what is meant by "broader category" from an

additional entry in the BusinessRule table. This entry is a

numerical value that tells the batch tallying program how many

levels to go up the ItemOrCategory hierarchy, as well as how

10   many levels to go down within their descendants, in making the

tallies. Based on the settings in BusinessRule entries, the

batch program can evaluate "broader category" to mean just

siblings and parents of a given category, or cousins and aunts

and uncles, or nieces and nephews in addition to cousins, or

15   second cousins, or third cousins, etc.

Also within the CategorizingEntity table is a field

called *TotalCategorizations*, which the batch programs update

to show a count of all ItemCategorizations for the category in

question whose *PersorgIdCreator* matches the *PersorgId* of the

20   CategorizingEntity in question.

FIG. 8 depicts an example for Content Categorization

Screen. The exemplary screen shown is one way users

categorize a page online in the system of the present

invention. (For magazines with online editions and other

25   high-volume content categorizers, there is also a batch update

utilizing a file that the categorizer provides.) Entering

this screen requires that the user be registered and logged on

to the system.

The categories are specified in a manner virtually

30   identical to the way they are selected in the Find Material

screen.

When the user types or pastes a URL in Item 81 and hits

Enter, the system first checks to see if an ItemorCategory

with *CategoryInd* = 2 exists in the database whose ItemDetail

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has a matching *URL*. If so, Items 82 and 83 are populated in a non-updateable manner with the existing ItemorCategory's *Name*

5   and *Description*; Item 84 is then populated in a non-updateable manner with the ItemDetail.*URL* of any ItemorCategory whose *ItemCatID* appears as the *ItemCatIDSubject* in an ItemCatCorrelation whose *ItemCatIDReference* matches that of the selected page, and whose corresponding

10   ItemCorrelationType.*SubjRoleDesc* is "Home Page."

If no ItemorCategory is found with an ItemDetail.*URL* matching what was entered in Item 81, the system determines whether or not the user has update rights to the ItemorCategory to be created, by searching for a match between

15   the beginning characters of the URL that the user has entered and the *URLPrefix* of a ReservedDomain owned by the PersonorOrganization making the categorization. If the user has this right, the System enables Items 82 and 83 to be updated; otherwise, the Systems goes to the URL in question,

20   and populates Item 82 with the page's Title, and Item 3 with the page's Description (which may be found in a meta tag as well as in a more traditional representation).

Regardless of whether or not a pre-existing ItemorCategory has been found in the database, Item 80, the

25   large display area to the right, is filled with an image or other non-functional view of the contents of the specified web page (i.e., if the user selects a menu item, button, or hyperlink within this display-only area, no action results).

If presented in updateable mode, what the user types in

30   Item 82 will become the *Name* of an updated or newly created ItemorCategory. If presented in updateable mode, what the user types in Item 83 will become the *Description* of an updated or newly created ItemorCategory.

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When a value is typed or pasted in Item 84, it will remain in place no matter how the user navigates through the pages displayed in Item 80. It will also remain in place through successive categorizations of different pages, until it is specifically removed or changed.

Note that if the user presses Enter after entering a value in this field, the Item 80 display area will show the page in question. Items 81,8 2, and 83 will also be populated, in the same manner as if the user had entered the value in Item 81 and pressed Enter. (This is a form of navigation that will be used frequently by magazines.)

Values in Item 85 are a concatenation of ItemorCategory.*Description* and corresponding CategoryDetail.*DnmMatchCount*. Initially, only those ItemsorCategories whose CategoryDetail.*TopLevelInd* = 1 are displayed. Thereafter, change contents per user inputs on Items 86, 87, 88, and 89. (NOTE: Any ItemorCategory whose *CategoryInd* is not = 1 is not displayed, no matter what the user does with items 86 through 89.)

When a user selects an ItemorCategory.*Description*, the row is highlighted and the selection is retained until the user specifically changes it. (For example, the user might want to categorize a number of pages as being about Osteomyelitis. It would be annoying for the user to have to go back and re-select this category after every individual, page-level categorization he makes.)

When Item 86 is selected, Item 85 is re-populated with only those ItemsorCategories with ItemCatCorrelations that are of the ItemCorrelationType whose *ReferenceRoleDesc* is "Is Included In," and whose *ItemCatIDReference* match the *ItemCatID* of the ItemorCategory that the user has selected from Item 85. The results are ordered by ItemCatCorrelation.*ReferenceSeq*.

Error Condition A: If button 86 is selected when the user has not selected a value from Item 85, the error message,
"Please select the content category to see more general values for" is displayed with an OK button.

Error Condition B: If button 85 is selected when no ItemCorrelations whose corresponding ItemCorrelationType.*ReferenceRoleDesc* is "Is Included In" the selected ItemorCategory as *ItemCatIDReference*, display the error message "No more general levels exist" is shown with an OK button.

When Item 87 is selected, Item 85 is re-populated with only those ItemsorCategories with ItemCatCorrelations that are of the ItemCorrelationType whose *SubjRoleDesc* is "Includes," and whose *ItemCatIDSubject* match the *ItemCatID* of the ItemorCategory that the user has selected from Item 85.   The results are ordered by ItemCatCorrelation.*SubjectSeq*.

Error Condition A: If button 87 is selected when the user has not selected a value from Item 85, the error message, "Please select the content category to see more specific values for" is displayed with an OK button.

Error Condition B: If button 87 is selected when no ItemCorrelations whose corresponding ItemCorrelationType.*SubjRoleDesc* is "Includes" the selected ItemorCategory as *ItemCatIDSubject*, display the error message "No more specific levels exist" is shown with an OK button.

Item 88 enables the user to bypass navigating through successive menu levels by partially typing a value here, then selecting on Item 9 to display any matches to what has been typed.   Trailing wildcards are assumed—i.e., in the example shown, just typing in "ost," without any special character as suffix, is enough to bring up "osteoblast," "osteoclasis," and all the other values shown.

When Item 89 is selected, Item 85 is populated with only those ItemsorCategories whose *Descriptions* begin with the characters that have been typed into Item 88. The results are irdered alphabetically.

If button 89 is selected when fewer than three characters have been entered into Item 88, the error message "Please enter at least the first three characters of the content category" is displayed. Item 80 is a display area for the page selected in Item 81.

FIG. 9 depicts the bottom half of the exemplary Content Categorization Screen of FIG. 8. When Item 91 is selected, the System begins by validating the home page relationship claimed in Item 4.

First, the System verifies that the URL entered for the home page matches the beginning of the URL of the page being categorized. If it does not, an error panel is generated with the message "Categorized page's URL must have the same beginning as that of its home page" and an OK button.

Next, the System verifies that the URL actually exists. (Issues an unseen call, then tests whether there is a "Page Not Found"-type error.) If the URL does not exist, an error panel with the message "Home page cannot be found" and an OK button is generated.

If the proposed categorization passes both of the tests described above, the System creates an entry for it in pending status in an internal data structure or array. (Note that the "Confirm and Post" button, Item 95, needs to be selected before categorizations are actually applied to the database, and the user is billed.)

When Item 92 is selected, a panel with a simple OK button is generated showing the *RuleSpecifiedValues* of the BusinessRules corresponding to the ItemorCategory the user has

selected whose Descriptions are "Posting Cost" and "Incentive
Payment Amount," respectively. If no ItemorCategory has been
5   selected, generate the error message, "Please select a Content
Category" followed by an OK button is produced.

Item 93 displays the sum of the posting costs for all
ContentCategorizations currently in pending status (i.e., all
for which Item 91 has been selected, but item 95 has not.)
10   Each time Item 91 is selected or categorizations are deleted
via the Review Categorizations panel, the sum is refreshed.
Posting   costs   are   found   in   BusinessRules   whose
ItemCatIdGoverned matches the *ItemCatId* of the ItemOrCategory
used as a categorizer, where BusinessRule.*Description* =
15   "Posting   Cost."   The   cost   itself   is   found   in
RuleSpecifiedValue. (See Appendix A).

When Item 94 is selected, the Review Categorizations sub-
screen (described in a subsequent page), is displayed allowing
the user to modify or delete categorizations that have not yet
20   been posted to the database.

When Item 95 is selected, the System posts all pending
categorizations and bills the appropriate CreditCard for the
PersonorOrganization making them.   A credit card pre-
authorization could be performed before actually posting
25   changes to the database, provided this would not slow
processing unacceptably.

FIG. 10 Illustrates an Exemplary Review Categorizations
Sub-Screen. The exemplary screen is generated when the user
selects the Review button (Item 94 of the Categorization
30   screen of FIG. 9). This screen enables the user to make last-
minute modifications as needed, including deletion of pending
categorizations to trim back his total categorization posting
cost for the session.   Every pending categorization is

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represented in this manner, with the Save Changes button being presented only once, at the bottom of the page.

Item 101 is only presented when the PersonorOrganization making the categorization has update rights to the content item, i.e., when a ReservedDomain exists whose *URLPrefix* matches the beginning of the ItemDetail.*URL* for the ItemorCategory to be categorized, and it shows the *PersorgID* of the PersonorOrganization making the categorization as its *PersorgIDOwner*. Selecting this checkbox enables Items 103-106 to be updated.

Item 102 is selected to make a last-minute decision not to post a categorization (typically to reduce costs when Item 93 of the main Content Categorization screen shows a total cost of categorizations above what the user had intended to spend. When Item 109, the Save Changes button, is selected, no categorization with its Delete checkbox checked will actually be posted to the database or charged to the user's credit card.

Item 103 is not updateable in the Review function; it is shown for informational purposes only. Item 104 is not updateable in the Review function; it is shown for informational purposes only. Item 105 is the *Name* of the ItemorCategory to be categorized. It is only shown in updateable form when the beginning of the *URL* of the ItemorCategory to be categorized matches the *URLPrefix* of a ReservedDomain belonging to the PersonorOrganization making the categorization.

Item 106 is the *Description* of the ItemorCategory to be categorized. It is only shown in updateable form when the beginning of the ItemDetail.*URL* for the ItemorCategory to be categorized matches the *URLPrefix* of a ReservedDomain

belonging to the PersonorOrganization making the categorization.

5   Item 107 is the *Description* of the selected ItemorCategory. This cannot be changed, and is shown for information purposes only. (If the user sees that a mistake has been made, he can delete the categorization and re-enter it more easily and accurately from the main Categorization
10   screen.)

The posting cost of the ItemOrCategory used as a categorizer is shown by Item 108. Posting costs are found in BusinessRules whose *ItemCatIdGoverned* matches the *ItemCatId* of the ItemOrCategory used as a categorizer, where
15   BusinessRule.*Description* = "Posting Cost." The cost itself is found in *RuleSpecifiedValue*.

Selecting the Save Changes button (Item 109) applies the modifications made on this screen to the pending categorizations, and returns the user to the main Content
20   Categorization screen with Item 93 (cost) updated to reflect the changes.

It will be recognized by those skilled in the art that various modifications may be made to the illustrated and other embodiments of the invention described above, without
25   departing from the broad inventive scope thereof. It will be understood therefore that the invention is not limited to the particular embodiments or arrangements disclosed, but is rather intended to cover any changes, adaptations or modifications which are within the scope and spirit of the
30   invention as defined by the appended claims.

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